**Note Outline 24.1.2 – Study of Light Continued**

III. Spectrosopy/Spectral Analysis

A. Defined as the study of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of light that depend on \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, or the spectral analysis of the 3 types of spectra.

B. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Spectrum: produced by an incandescent solid, liquid or gas under \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pressure. Appears as an uninterrupted band of color (rainbow).

i. incandescent = “to emit light when hot”, not all substances behave incandescently.

C. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Spectrum: produced when visible light (usually from a star) is passed through a relatively \_\_\_\_\_\_\_\_\_\_\_\_ gas under \_\_\_\_\_\_\_ pressure. The gas \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ selected λ’s of light. Appears as a band of color with dark lines.

D. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Spectrum: produced by a \_\_\_\_\_\_\_ gas under \_\_\_\_\_\_\_ pressure. Appears as a series of bright lines of particular λ’s depending on the gas that produces them.

E. Most stars’ spectra are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ or “dark-line” spectra.

i. Each element or compound produces a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ set of spectral lines.

ii. The unique spectra of different elements/compounds can be used to identify a star’s \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - like a finger print.

IV. Doppler Effect

A. The perceived change in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a sound/light wave that is emitted from a source moving \_\_\_\_\_\_\_\_\_\_\_\_\_ or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ an observer.

B. Visible light from a source moving \_\_\_\_\_\_\_\_\_\_\_\_\_\_ from an observer appears \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because its waves are lengthened (stretched).

C. Visible light from a source moving \_\_\_\_\_\_\_\_\_\_\_\_\_\_ an observer appears \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ because its waves are shortened (compressed or squished).

D. The amount of red or blue shift is related to the \_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the source (how fast its moving toward or away from the observer).

i. Larger shifts = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rates of movement

ii. Smaller shifts = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ rates of movement

E. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_is used to determine whether a star or other celestial body is moving away from or towards Earth.